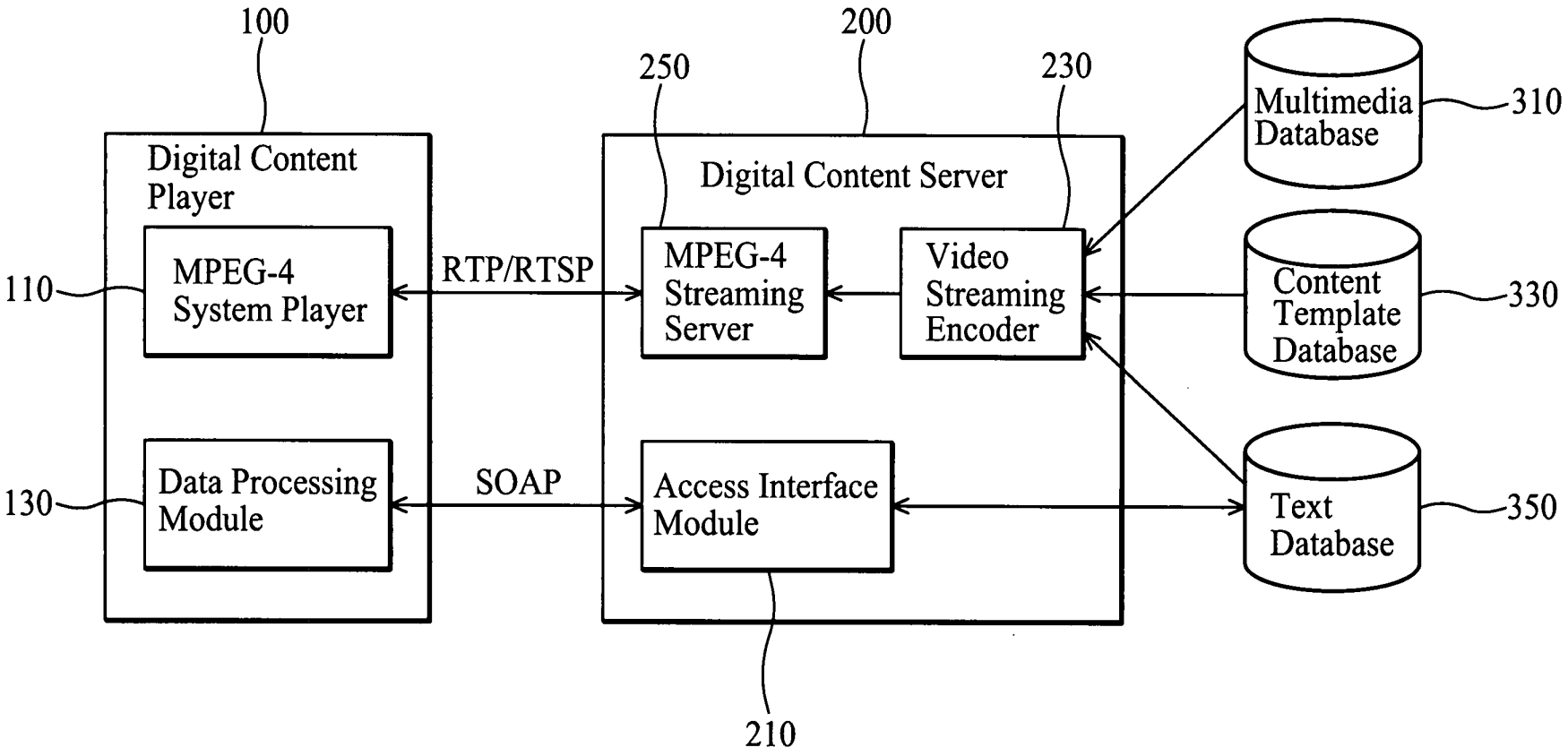
100
200
250
230
Digital Content Player
Digital Content Server
MPEG-4 System Player
110
RTP/RTSP
MPEG-4 Streaming Server
Video Streaming Encoder
Multimedia Database
310
Content Template Database
330
Data Processing Module
130
SOAP
Access Interface Module
Text Database
350
210

FIG. 1

```
PROTO Definition :
PROTO ProText [
  exposedField MFString ltext NULL
  exposedField SFString remoteUrl "http://140.92.71.1/"
]{
    Transform2D {
     translation  -141.000000 162.000000
     children
     [
      Shape {
       appearance  Appearance {
          material  Material2D {
             emissiveColor  1.000000 1.000000 1.000000
           }
        }
       geometry Text {
          string  IS ltext
          fontStyle  FontStyle {
             justify  [ "BEGIN" "BEGIN" ]
             size  20.000000
          }
       }
      }
     ]
    }
}
```

FIG. 2

```
PROTO-Type Defined :
OrderedGroup {
 children
 [
  ProText {
   ltext [ "Chinese"]
  }
 ]
}
```

FIG. 3

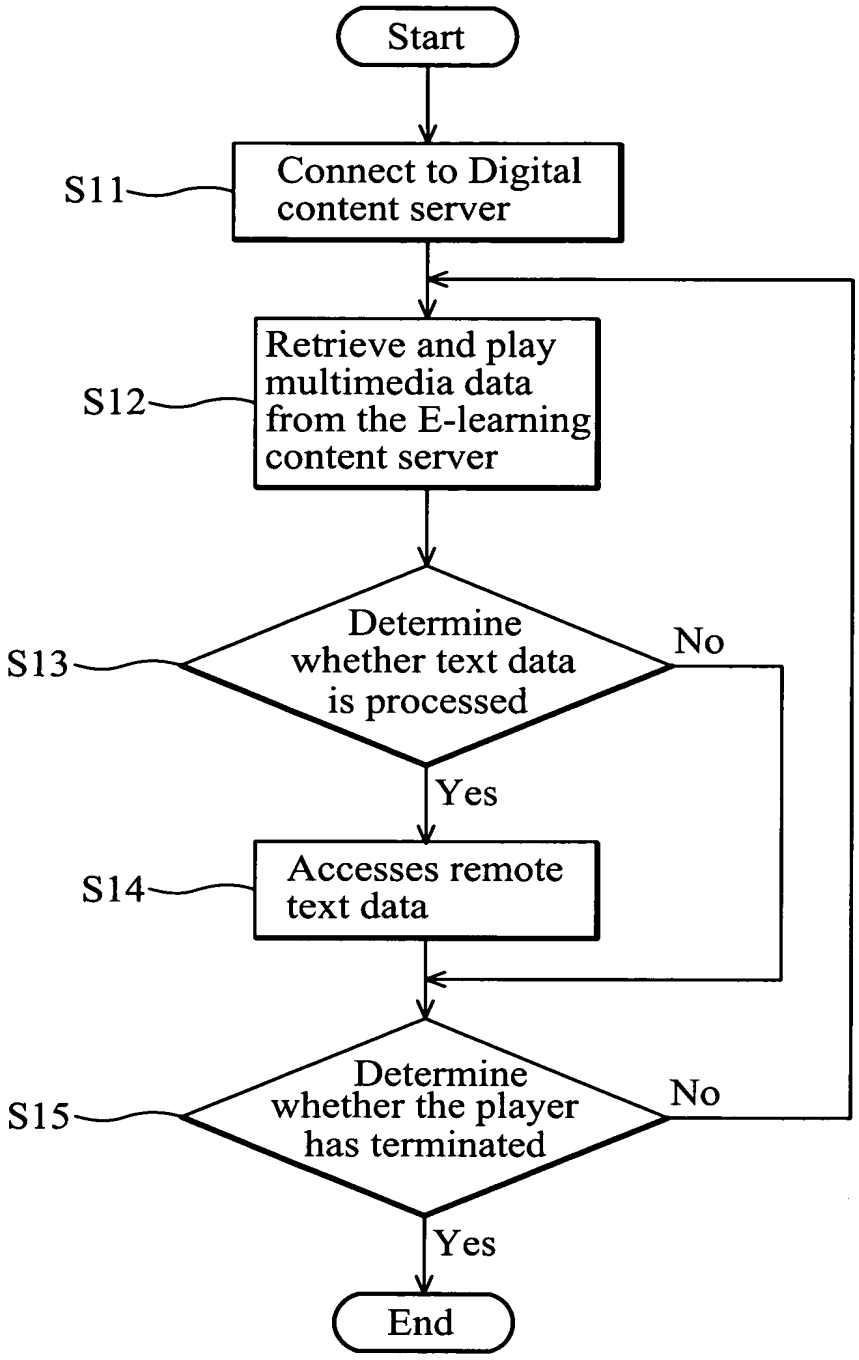
Start
S11
Connect to Digital content server
S12
Retrieve and play multimedia data from the E-learning content server
S13
Determine whether text data is processed
No
Yes
S14
Accesses remote text data
S15
Determine whether the player has terminated
No
Yes
End

FIG. 4

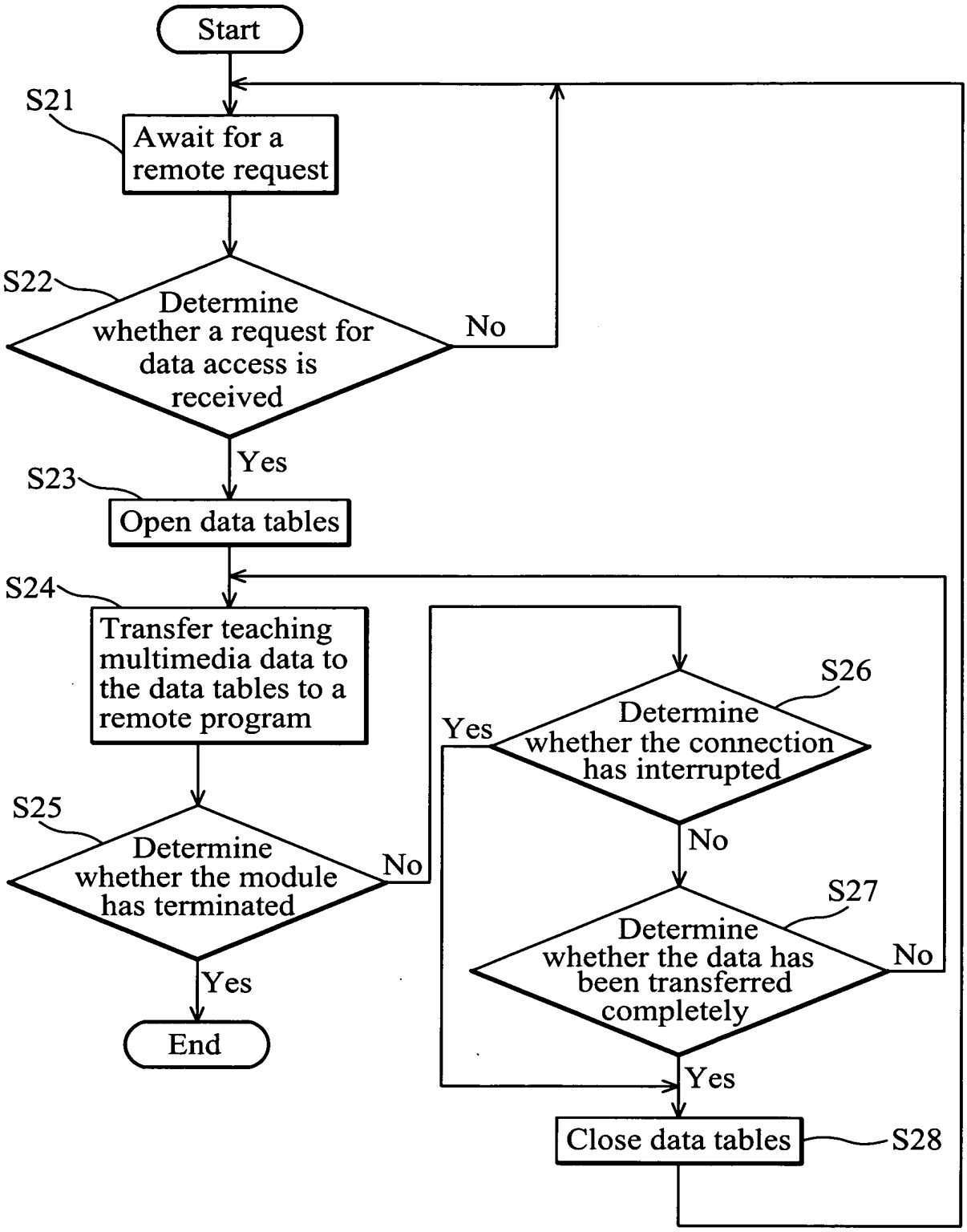
Start
S21
Await for a remote request
S22
Determine whether a request for data access is received
No
Yes
S23
Open data tables
S24
Transfer teaching multimedia data to the data tables to a remote program
S25
Determine whether the module has terminated
No
Yes
End
S26
Determine whether the connection has interrupted
Yes
No
S27
Determine whether the data has been transferred completely
No
Yes
Close data tables
S28

FIG. 5

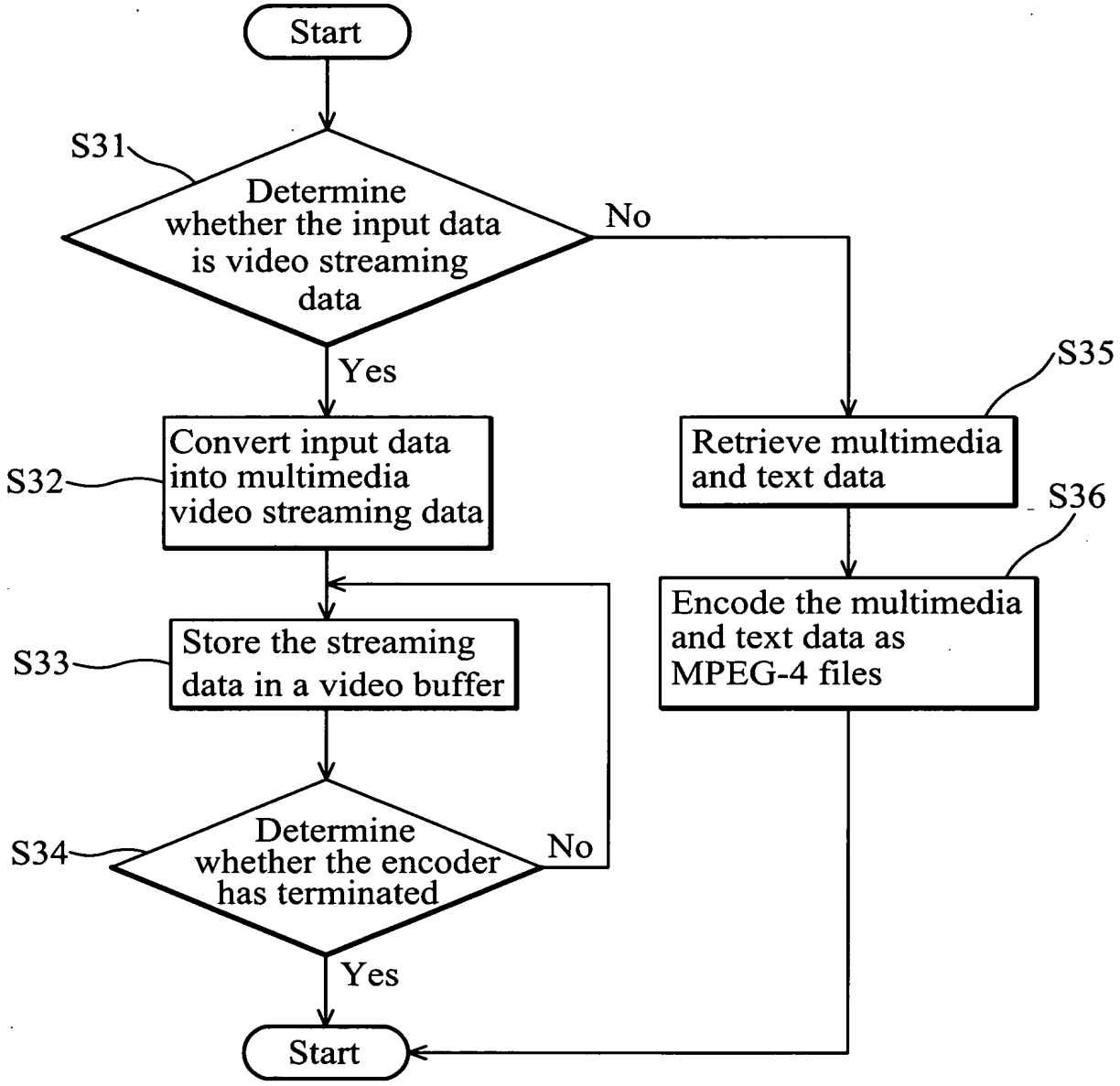
Start
S31
Determine whether the input data is video streaming data
No
Yes
S35
Retrieve multimedia and text data
S32
Convert input data into multimedia video streaming data
S36
Encode the multimedia and text data as MPEG-4 files
S33
Store the streaming data in a video buffer
S34
Determine whether the encoder has terminated
No
Yes
Start

FIG. 6

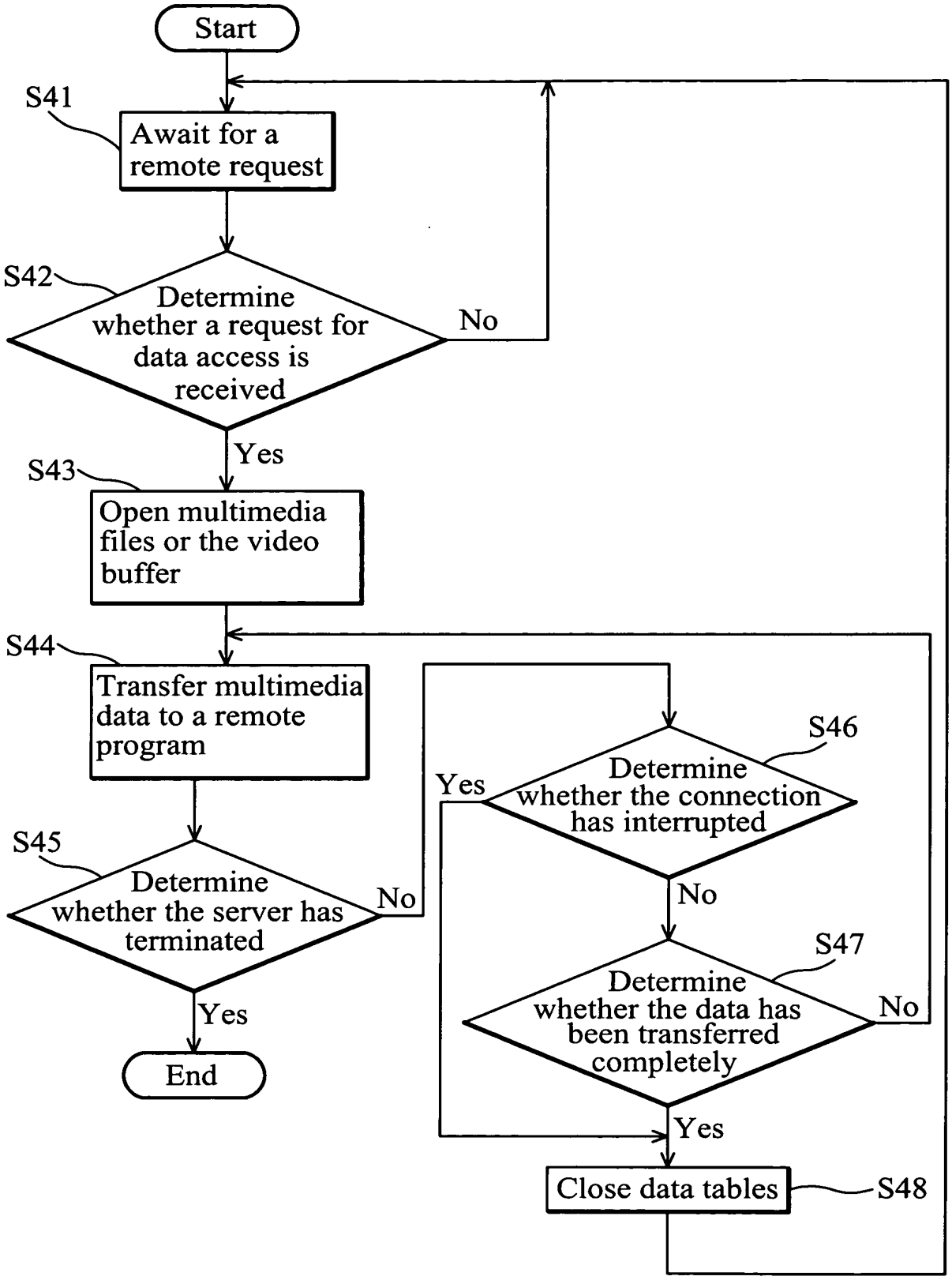
Start
S41
Await for a remote request
S42
Determine whether a request for data access is received
No
Yes
S43
Open multimedia files or the video buffer
S44
Transfer multimedia data to a remote program
S45
Determine whether the server has terminated
No
Yes
End
S46
Determine whether the connection has interrupted
Yes
No
S47
Determine whether the data has been transferred completely
No
Yes
Close data tables
S48

FIG. 7